

HEATED DISPOSABLE TOWELS

FIELD OF THE INVENTION

- 5 This invention relates to a disposable towel that contains a heat source for a more comfortable use. More particularly, the invention relates to a disposable towel in which an exothermic reaction contained within the towel generates sufficient heat to facilitate the use of the towel.

BACKGROUND OF THE INVENTION

Wet and dry wipes are well known commercial, consumer, hospital and nursing home products that are available in many forms. These wet and dry wipes are available in interfolded, folded or unfolded configurations. For example, stacks of Wet and dry wipes have been available wherein each of the Wet and dry wipes in the stack has been arranged in a folded configuration, such as a c-folded, z-folded, or quarter-folded configuration.

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Wet and dry wipes have also been dispensed in sheets from a tub like container with a hinged lid on the top. The lid is opened and individual or singularized sheets of the wipes are removed. Another type of container that has been used for wet and dry wipes provides a roll of wipes in which the wipes are pulled from the top of the container in a direction that is parallel to the axis of the roll. These wipes are pulled from the center of a hollow coreless roll that has perforated sheets,

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These wet and dry wipes can also be packaged in a semi-flexible pouch which has a stack of rectangular-shaped, moistened sheets, available in the same configuration as above. These packages are commonly made of an impervious film, typically a polyolefin. This film prevents external contamination from entering the package directly through the walls of the package. The package frequently has a re-closable cover flap. The re-closable cover flap articulates between an open position and a closed position. The open position allows for dispensing hygienic articles from

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the package. In the closed position, the cover flap prevents the hygienic articles from inadvertently falling out of the package.

5 Wet and dry wipes may comprise of an absorbent sheet can be any wipe, towel tissue or sheet like product including natural fibers, synthetic fibers, synthetic material and combinations thereof, that is wet or moist or becomes wet during use or prior to use or prepared and treated to impart wet strength thereto, preferably having the dimensions of the usual wash cloth.

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Wet and dry wipes have been made from this variety of materials and that have been moistened with a variety of suitable wiping solutions. The liquid employed in the pre-moistening of the wet sheet is generally an aqueous alcoholic or non-alcoholic solution which may further contain a
15 surface active detergent and a humectants and, in some instances, also a scenting agent.

Typically, the wet and dry wipes have been designed to provide multiply or one-at-a-time dispensing, which can be accomplished using a single
20 hand. Such single-handed, multiply one-at-a-time dispensing, is particularly desirable because the other hand of the user is typically required to be simultaneously used for other activities.

For example, wet products such as wet and dry wipes have many
25 applications. They may be used with small children and infants when

changing diapers, they may be used for household cleaning tasks, they may be used for cleaning hands, they may be used as a bath tissue, they may be used by a caregiver to clean a disabled or incontinent adult/baby, or they may be used in and for a whole host of other applications, where
5 it is advantageous to have a wipe or towel that has some moisture in it and is warm to touch and use on the skin.

Currently these products are placed in suitable heating containers that might include microwaves, heated water or toaster like devices, which
10 then are heated from 98 ° to over 110°.

Once removed from these heating sources, the user or caregiver must guess at the temperatures and if too hot can affect the skin of the patient or user and could cause skin damage. In the case of an infant it can also
15 cause death, or long term damage.

Disposable towels are also handy for many ordinary situations where it is necessary to clean spills, dirt, and other contaminating agents, particularly when a person comes into contact with a substance that
20 needs to be removed quickly. It is particularly helpful to have a heated towel when low melting substances, such as butter, mayonnaise, cold cream, makeup and other similar cosmetic materials are to be removed. Because these materials, inter alia, are difficult to wash out of a towel, it is easier to use disposable towels rather than attempting to wash the
25 towel, reconstitute it to provide heat on demand, and re-use it.

A number of prior art products have been proposed to develop heatable towels. Ravich U.S. Patent No. 3,889,804 relates to wet disposable towels that are heated by mixing a reducing agent and an oxidizing agent that have been kept separate until use. Examples of oxidizing agents are
5 hydrogen peroxide and urea hydrogen peroxide, while reducing agents are thiourea and thiobarbituric acid. This generally discloses the concept of warmed towels but does not disclose a source of heat other than by mixing two chemicals that must be kept apart to prevent premature heat generation. The reaction is not totally controlled and, because it is a
10 reaction between two chemicals, care must be taken to insure the heat does not build up too rapidly.

Caillouette et al. U.S. Patent No. 3,175,558 discloses a thermal therapeutic pack in which a liquid is separated from other chemicals
15 that either release or absorb heat when mixed. Bourne et al. U.S. Patent No. 4,011,945 discloses a bandage that has a water reservoir and a solid endothermic material that react to cool the burn when the bandage is squeezed to break a seal. Patel U.S. Patent No. 4,397,315 is another bandage design where a wall ruptures when the use of bandage. Both of
20 these references require the chemicals to be contained in separate compartments.

The use of supercooled liquids has been an available technology for over 100 years for generating an exothermic reaction under controlled
25 circumstances. U.S. Patent Nos. 4,872,442 and 4,889,953 to Manker disclose the use of activators to initiate crystallization or destabilization

of a super-cooled aqueous salt solution to cause the generation of heat in a heat pack. Stainless steel, beryllium-copper alloys and phosphor-bronze alloys are used. Hettle et al. U.S. Patent No. 5,056,589 also uses stainless steel to trigger thermal energy packs to release heat from
5 super-cooled solutions. Cheney U.S. Patent No. 5,143,048 discloses an infant heel warmer using supercooled solutions of sodium acetate and hydroxyethyl cellulose together, along with a disk or ampoule that contains sodium acetate crystals that are released when the disk or ampoule is broken to expose the solution to the crystals. Finally, Milligan
10 et al. U.S. Patent No. 5,275,156 teaches a reusable device in which a trigger causes crystallization of materials such as sodium acetate tetrahydrate by contact with rigid objects, such as small spheres, wherein the rolling action of the spheres is said to produce crystallization of the solution. It would be a great advantage if a towel
15 device could be made that would have no metal or other contaminating components as the crystallization inducing element.

Another advantage would be to provide a disposable towel system that is self-heating and that is safe to use on the face, hands and arms of
20 humans.

Yet another advantage of the present invention is that it is simple to manufacture and is inexpensive to produce.

25 Other advantages will appear hereinafter.

SUMMARY OF THE INVENTION

It has now been discovered that the above and other objects of the present invention may be accomplished in the following manner. The
5 unique aspect of this invention is the ability to initiate an exothermic reaction without the use of metal or other components, such that the exotherm begins using a small quantity of the solid form of the compound. Preferred materials are sodium acetate and sodium carbonate, with the latter being most preferred.

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In it's simplest form the invention comprises a single or dual chamber plastic ampoule or like structure, similar to a straw or other breakable object that contains an exotherm to create a heat pack. Once crushed or broken the chamber releases the active ingredient, such as the
15 aforementioned sodium acetate or sodium carbonate, though other exotherms may be employed.

The exotherm is a super cooled liquid that is also quite stable as a liquid. By crushing or breaking the plastic structure, a few molecules are forced
20 to flip to the solid state, and the rest of the liquid then rushes to solidify as well. This causes the temperature of the solidifying liquid to jump to a controlled temperature up to 130 °F in the process. The preferred method to causes the crystallization is by adding a tiny bit of crystal from a protected source. Once released it would cause the exothermic heat
25 reaction.

This released reaction then causes the fabric of the wipes to be heated. The released heat would be controlled by the quantity of exotherms contained in the breakable object. This source would be placed between the wipes made of natural fibers, synthetic fibers, synthetic material and combinations thereof, and once crush or broken would cause a reaction. 5 to become heated.

In order to determine the temperature, the flexible or ridged package would have may have a heat sensitive ink or indicator that could be of any 10 material that would change color when the correct temperature is reached. The package may also have a label or strip made of a material capable of indicating the rise of the temperature. These indicators could also be placed on top or between the wipes to indicate temperature or rise in temperature. If the ink or indicator changes color with increased 15 temperature, the trademark, for example, could reach a new color when the towels are ready for use, and a warning label would change color if the temperature exceeded a desired or predetermined limit.

BRIEF DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the invention, reference is hereby made to the drawings, in which:

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FIGURE 1 is a perspective view of the preferred embodiment of the invention shown in place with towels; and

FIGURES 2A and 2B are plan views of the packaging for the device
10 shown in FIGURE 1;

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the figures, the device 10 is a small ampoule for use with a number of towels 11, as seen in Fig. 1. The number of towels will be
5 determined by the intended end use, and may be as few as one or two towels or wipes, and may be one or two dozen. The primary factor to use to determine the number of wipes or towels will be the size of the package and the use to which they will be put. In some instances, such as when desires to wash his or her hands and face, a small package of
10 three or four towels will be satisfactory. In other cases, such as when the towels are to be used by number of people, such as in a school classroom, more than a dozen may be needed.

For the purpose of this invention, the term "towel" is defined as any of
15 the wet or dry wipes well known for use in commercial, consumer, hospital and nursing home products. These wet and/or dry wipes are available in interfolded, folded or unfolded configurations. For example, stacks of wet and dry wipes have been available wherein each of the Wet and dry wipes in the stack has been arranged in a folded configuration,
20 such as a c-folded, z-folded, or quarter-folded configuration. The "towel" may be made of paper, cloth or synthetic materials and may be woven, non woven, matted or otherwise formed into a wet or dry wipe shape and size.

25 The towels of the present invention are heated by an exothermic reaction of supercooled liquid crystallizing into a solid form. Any such

material that has the ability to initiate an exothermic reaction without the use of metal or other components may be used. Preferred materials are sodium acetate and sodium carbonate, with the latter being most preferred.

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The container or ampoule 17 of the present invention is formed from plastic, straw, or any other material that can be easily fractured or broken to release the small amount of crystal for contact with the liquid.

Ampoule 17 is placed in the middle of a stack of towels 11, as seen if

10 Fig. 1. Then the entire stack of folded towels is placed in a package for shipment, storage, display and purchase. The user then takes the package and uses one or more towels as needed.

Ampoule 17 is formed from plastic or other materials that are suitable
15 for keeping a liquid such as supercooled liquid 19 on one side of ampoule 17 and separated from the other side by a liquid impervious barrier 21. In the other side of ampoule 17 is a small quantity 23 of the crystal form of the supercooled liquid. When ampoule 17 is flexed, it breaks and the crystal 23 mixes in the liquid 19 because barrier 21 has
20 been broken or removed by the twisting action. This initiates the exothermic reaction and heat is transferred to the towels 11.

In Fig. 2, one preferred packaging element is shown. Package 31 includes a front side 33 and a back side 35, the latter of which contains
25 the usual manufacturing data. Front side 33 includes instructions and a temperature indicator 37 which advances in color as the temperature

increases in order to inform the user of the degree of exotherm. The ampoule 17, which is inside towels 11 which are inside package 31, is broken by flexing the package until the user senses that the ampoule has snapped or broken. The user will also feel heat beginning to be released in the form of a crystallization exotherm by the supercooled liquid inside the ampoule. When the indicator 37 shows the temperature for use has been reached, the package 31 is opened and towels are used as needed. These temperature indicating labels have in inbuilt adhesive that can be attached to the outside label to indicate and record the temperature.

When the temperature is increasing as the nominated temperature is exceeded, the label color will change to show the number of temperature increments 37a, 37b, etc. that have been reached or exceeded. The indicator has a permanent recording function so that the maximum temperature reaches is always recorded. Such labels are available commercially. Technical Industrials Inc. manufactures and sells such products, which have the name Temperature Recording Labels in the industry. It is also contemplated to use Irreversible Temperature Paint/Inks, which would be used to print the labels, such as the logo shown in the drawings, and once the ampoule was broken, the rising heat would change the color in the name. Once the whole name turned a desired color, the package would be opened and the towels used.

While particular embodiments of the present invention have been illustrated and described, it is not intended to limit the invention to any specific embodiment. The description of the invention is not intended to limit the invention.